



**FIXED PRICE  
RESEARCH & DEVELOPMENT SUBCONTRACT**

**Subcontract No. Specimen Contract  
Dated May 24, 2004**

**BETWEEN**

**CALIFORNIA INSTITUTE OF TECHNOLOGY  
JET PROPULSION LABORATORY  
(The "Institute" or "JPL")  
4800 OAK GROVE DRIVE  
PASADENA, CALIFORNIA 91109-8099**

**AND**

**TBD**

**THIS CONTRACT FOR**

**UHF Proximity Antenna**

**IS A**

**SUBCONTRACT UNDER JPL's NASA PRIME CONTRACT**

**TASK ORDER NO. TBD**

**A DO - C9 Rating is assigned to this Subcontract under DMS Regulation 1**

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The following documents are incorporated into and made a material part of this Subcontract.

GENERAL PROVISIONS: Fixed-Price Research and Development Contract R 8/03, with Included Exhibits.

- JPL 1737, “Release of Information” R 9/99
- JPL 2385, “Notification to Prospective Contractors of JPL's Ethics Policies and Anti-Kickback Hotline” R 7/91
- JPL 2892, “Certifications” R 8/01
- JPL 2895, “Asbestos Notification” R 9/98
- Notice of Potential Tax Withholding R 7/03

ADDITIONAL GENERAL PROVISIONS (AGPs)

New Technology R 8/01 (Applicable for Large Business)

**OR**

Patent Rights - Retention By The Contractor (Short Form) R 4/99 (Applicable for Small Business)

Progress Payments R 4/99 (Applicable for Large Business)

**OR**

Progress Payments - Small Business R 4/99 (Applicable for Small Business)

PREAMBLE

This Subcontract, entered into on \_\_\_\_\_ by and between the CALIFORNIA INSTITUTE OF TECHNOLOGY (hereinafter called the "Institute" or "JPL"), a corporation organized and existing under the laws of the State of California, and TBD (hereinafter called the "Subcontractor"), a corporation organized and existing under the laws of the State of {Type State of Incorporation here} and constituting a subcontract under prime contract with NASA;

WITNESSETH THAT:

The Subcontractor agrees to furnish and deliver the supplies and perform the services set forth in this Subcontract for the consideration stated herein.

## SCHEDULE

## ARTICLE 1. STATEMENT OF WORK AND DELIVERY INSTRUCTIONS

		<u>On or Before</u>
1.0	The Subcontractor shall provide the necessary labor, facilities, services, and management to design a UHF proximity antenna In Accordance With (IAW) Exhibits I and II.	
	In the performance of this effort the Subcontractor shall:	
1.1	<b>Medium Gain Design.</b> Design a medium gain UHF antenna IAW Exhibit I.	
1.1.1	Conduct a Subcontract Kickoff meeting with JPL personnel participation at the Subcontractor's facility.	1 Week After Date of Contract (ADOC)
1.1.2	Submit an initial baseline work schedule identifying critical milestones.	2 Weeks ADOC
1.1.3	Participate in bi-weekly teleconferences with JPL (not to exceed 2 hours each) regarding status, design issues, and mutual concerns.	Bi-Weekly continuing through end of Contract
1.1.4	Interact via bi-weekly teleconferences with JPL (not to exceed 2 hours each) regarding mechanical and electrical interfaces to the Mars Telecom Orbiter (MTO) antenna platform.	Bi-weekly continuing through end of Contract
1.1.5	Provide a detailed design and the antenna performance characteristics for a flight qualifiable, medium gain (15 dBi) antenna to function within the MTO spacecraft IAW Exhibit I.	3 Months ADOC
1.1.6	Deliver to JPL, a detailed design, performance, and technical specification final report IAW Exhibit I, Exhibit II/RE-001, and JPL D-4410, Preparation of Hardware Specification or JPL approved equivalent.	3 Months ADOC
1.1.7	Formally present the medium gain design at JPL and interact with JPL regarding antenna performance and issues relating to the construction of a flight qualifiable UHF antenna IAW Exhibit I.	3 Months ADOC

- 1.2 **High Gain Parametric Study.** Perform a high gain UHF antenna design parametric study for gain values between 15 and 20 dBi IAW Exhibit I.
- |       |  |               |
|-------|--|---------------|
| 1.2.1 | Provide a design concept and configuration for a high gain antenna with a parametric study of antenna performance characteristics for a flight qualifiable, high gain (15-20 dBi) antenna to function within the MTO spacecraft IAW Exhibit I. | 3 Months ADOC |
| 1.2.2 | Deliver to JPL, analysis, performance, and design concept and configuration final report IAW Exhibit II/RE-002.  | 3 Months ADOC |
| 1.2.3 | Formally present the results from the high gain parametric study at JPL and interact with JPL regarding antenna performance and issues relating to the construction of a flight qualifiable UHF antenna IAW Exhibit I.                         | 3 Months ADOC |

### **OPTION 1**

- 2.0 **Breadboard Antenna.** Design, fabricate and deliver one (1) Breadboard (BB) flight qualifiable Mars UHF Proximity Antenna (MUPA) Assembly IAW Exhibit I and JPL approved design developed under paragraph 1.0.
- |     |   |  |
|-----|---|--|
| 2.1 | Conduct a Subcontract kickoff meeting to discuss the overall approach and schedule with JPL personnel participation at the Subcontractor's facility.  | Within 2 weeks after execution of Option 1   |
| 2.2 | Provide a detailed design and technical specification for the BB MUPA IAW JPL D-4410, Preparation of Hardware Specification or JPL approved equivalent.   | 3 Weeks after execution of Option 1          |
| 2.3 | Submit an initial baseline work schedule identifying critical milestones.   | 3 Weeks after execution of Option 1          |
| 2.4 | Prepare and submit for JPL approval a MUPA Assembly and Test Work Flow Plan IAW Exhibit II/QA-003. The plan must allow selection of mandatory control points for inspection as agreed to between JPL and the Subcontractor. | 3 Weeks after execution of Option 1          |
| 2.5 | Participate in bi-weekly teleconferences with JPL (not to exceed 2 hours each) regarding status, design issues, and mutual concerns.  | Bi-weekly continuing through end of Contract |
| 2.6 | Submit an informal monthly status report identifying technical/schedule status and problems including any schedule variance and mitigation plans.   | Monthly continuing through end of Contract   |
| 2.7 | Perform and provide to JPL a detailed mechanical design along with supporting analyses to show that the BB MUPA assembly can meet or exceed the environmental and functional requirements specified in Exhibit I.           | 6 Weeks after execution of Option 1          |

- |      |  |  |
|------|--|--|
| 2.8  | Conduct a BB status meeting with JPL personnel participation at the Subcontractor's facility. The meeting shall include identification of technical/schedule status and problems including any schedule variance and mitigation plans. The Subcontractor shall document the meeting and results of the BB status meeting (including Request for Action (RFAs) if any) in a memo and provide those results to JPL within two weeks following the Meeting. | 2 Months after execution of Option 1   |
| 2.9  | Fabricate one (1) BB UHF antenna and verify its performance characteristics IAW Exhibit I and Exhibit II/TE-001 and TE-002.  | 4 Months after execution of Option 1   |
| 2.10 | Deliver a BB UHF antenna to JPL  | 5 Months after execution of Option 1   |
| 2.11 | Deliver to JPL, a detailed design, performance, and technical specification final report IAW Exhibit I and JPL D-4410, Preparation of Hardware Specification or JPL approved equivalent.   | 5 Months after execution of Option 1   |
| 2.12 | Formally present the BB design and performance testing results at JPL and interact with JPL regarding antenna performance and issues relating to the construction of a flight qualifiable UHF antenna IAW Exhibit I.   | 5.5 Months after execution of Option 1 |

## **OPTION 2**

- 3.0     **Engineering Model Antenna.** The Subcontractor shall provide all the necessary, labor, facilities, services, equipment, materials, and management to design, fabricate, assemble, test, provide documentation for and deliver to JPL (1) Engineering Model (EM) Mars UHF Proximity Antenna (MUPA) Assembly IAW the performance specifications detailed in Exhibits I and II. In the performance of this effort the Contractor shall:
- |     |   |  |
|-----|---|--|
| 3.1 | Conduct a Subcontract kickoff meeting with JPL personnel participation at the Subcontractor's facility.   | Within 2 weeks after execution of Option 2   |
| 3.2 | Submit an initial baseline work schedule identifying critical milestones.   | 2 Weeks after execution of Option 2          |
| 3.3 | Participate in bi-weekly teleconferences with JPL (not to exceed 2 hours each) regarding status, design issues, and mutual concerns.              | Bi-weekly continuing through end of Contract |
| 3.4 | Submit an informal monthly status report identifying technical/schedule status and problems including any schedule variance and mitigation plans. | Monthly continuing through end of Contract   |

- |      |  |  |
|------|--|--|
| 3.5  | Prepare and submit for JPL approval an EM MUPA Assembly and Test Work Flow Plan IAW Exhibit II/QA-001 and QA-003, respectively. The plan must allow selection of mandatory control points for inspection at the discretion of JPL.   | 8 Weeks after execution of Option 2                |
| 3.6  | Perform and provide to JPL a detailed mechanical design along with supporting analyses to show that the EM MUPA assembly meets or exceeds the environmental and functional requirements specified in Exhibit I.  | 10 Weeks after execution of Option 2               |
| 3.7  | Prior to beginning build activities on the MUPA, conduct a Critical Design Review (CDR) at the Subcontractor's facility IAW Exhibit II/RE-003. Notify JPL at least two weeks in advance of the date of the review.   | 4 Months after execution of Option 2               |
| 3.8  | Perform source, incoming and in-process inspection for all deliverable EM parts and assembly IAW Exhibit II/QA-002, QA-003, PA-002 and MP-002.   | As required by MUPA Assembly & Test Work Flow Plan |
| 3.9  | All tests of the EM MUPA assembly shall be conducted IAW the JPL approved test procedure and tested to the protoflight levels IAW Exhibit I and Exhibit II/RA-001.   | As required by MUOA Assembly & Test Work Flow Plan |
| 3.10 | Conduct and document acceptance tests EM MUPA assembly in accordance to the plans and procedures of Exhibit II/TE-001, TE-002 and TE-003. Notify JPL 72 hours in advance of acceptance tests and permit JPL engineers to witness the tests if available. Provide test results in hard copy and electronic form (on removable driver or CD ROM in an Excel spreadsheet, ASCII text, or other mutually agreed upon data format). | 9 Months after execution of Option 2               |
| 3.11 | Deliver to JPL one (1) completed EM MUPA assembly and associated documentation IAW Exhibits I and II.  | 9.5 Months after execution of Option 2             |
| 3.12 | Certify that the End Item Data Packages (EIDPs) delivered with the unit are IAW Exhibit II/QA-002.   | 9.5 Months after execution of Option 2             |
| 4.0  | The following Exhibits are hereby incorporated into and the references therein are made a material requirement of this Contract:   |  |
| 4.1  | Exhibit I – Mars UHF Proximity Antenna (MUPA)Functional, Development, and Testing Requirements Document, dated June 18, 2004, JPL D-28693 Version A  |  |
| 4.2  | Exhibit II – Mars UHF Proximity Antenna (MUPA) Contract Data Requirements List, dated May 24, 2004   |  |
| 5.0  | Delivery Requirements  |  |
| 5.1  | Except as otherwise provided in this Subcontract, the point of inspection, acceptance and delivery of all supplies deliverable under this Subcontract shall be the Jet Propulsion Laboratory, 4800 Oak   |  |

Grove Drive, Pasadena, California 91109. All such supplies shall be packaged, packed, boxed, or crated in such a manner to ensure safe delivery and shall be shipped prepaid and at the Subcontractor's expense to the point of delivery.

- 5.2 Time is of the essence in the performance of this Subcontract
- 5.3 The period of performance shall extend from date of Contract through **TBD**

**If New Technology is Applicable \*\*DELETE IF NOT\*\***

- 5.4 The Subcontractor shall furnish the cognizant JPL Negotiator with the annual and final reports of reportable items described in the Article entitled "New Technology." A copy of transmittal letters for those reports shall also be sent to the Intellectual Property Office (IPO).

Interim report every 12 months commencing on Date of Subcontract-Final Report within three months of completion of work

**OR**

**If Patent Rights is Applicable \*\*DELETE IF NOT\*\***

- 5.5 The Subcontractor shall provide the cognizant JPL Negotiator with the annual and final reports of subject inventions described in the Article entitled "Patent Rights – Retention by the Contractor (Short Form)." A copy of transmittal letters shall be sent to the Intellectual Property Office (IPO).

Interim report every 12 months commencing on Date of Subcontract-Final Report prior to Subcontract completion

**If property is either furnished or acquired, the requirements of "Management of Government Property in the Possession of Contractors" Form JPL 0968 are applicable and NASA Form 1018 shall be submitted in accordance with the following schedule.**

- 5.6 NASA Form 1018 (or equivalent), "NASA Property in the Custody of Contractors"

- 5.6.1 Quarterly Submission commencing on date of Subcontract through completion

Three (3) Business days after reporting period

Reporting Period

Oct 1 thru Dec 31

Jan 1 thru Mar 31

Apr 1 thru June 30

Jul 1 thru Sept 30

- 5.6.2 Annual Submission commencing on date of Subcontract through completion

Annually, Fifteen (15) Business days after reporting period

Reporting Period

Oct 1 thru Sept 30

- 5.6.3 Annual Verification of Government-Owned/Subcontractor-Held Property

Annually, 30 days after receipt of list from JPL thru Subcontract Completion



5.7 Form SF 294, "Subcontracting Report for Individual Contracts"

SF 294 from date of Subcontract thru March 31 and September 30 and semiannually thereafter through Subcontract completion

5.8 Form SF 295, "Summary Subcontract Report

SF 295 from date of Subcontract thru September 30th and annually thereafter through Subcontract completion

6.0 JPL will:

- 6.1 Review and approve or disapprove documents submitted by the Subcontractor within ten (10) working days after receipt at JPL (unless otherwise specified).
- 6.2 Participate in meetings and performance reviews.
- 6.3 Provide JPL QA personnel to perform inspections.
- 6.4 Provide technical direction, as applicable and necessary, to the Subcontractor from the JPL Contract Technical Manager via the JPL Subcontracts Manager with an approved Technical Direction Memorandum (TDM), JPL Form 2084-S.

ARTICLE 2. PRICE AND PAYMENT

1.0 Price consisting of:

Basic Subcontract effort as specified in Article 1, paragraph 1.0 at \$TBD.  
Option 1 effort as specified in Article 1, paragraph 2.0 at \$TBD.  
Option 2 effort as specified in Article 1, paragraph 3.0 at \$TBD.

Total Fixed Price: \$TBD

2.0 Progress payments will be allowed according to the terms set forth in the Additional General Provision entitled  
"Progress Payments - Small Business."

**OR**

3.0 Progress payments will be allowed according to the terms set forth in the Additional General Provision entitled  
"Progress Payments."

4.0 Invoices. Invoices shall be submitted, in triplicate, to JPL Supplier Payment Section, M/S 601-208, 4800 Oak Grove Drive, Pasadena, California 91109.

The Subcontractor shall attach to each invoice, submitted in accordance with the General Provision of this Subcontract entitled "Payments and Discounts," a fully completed "Contractor's Request for Progress Payment," Standard Form 1443, or equivalent.

**Detailed billing instructions and samples that will ensure the correct processing of your invoices can be found at the following link:**

[http://acquisition.jpl.nasa.gov/pdf/FP\\_Billing.pdf](http://acquisition.jpl.nasa.gov/pdf/FP_Billing.pdf)

## ARTICLE 3. OPTIONS

### 1.0 OPTION 1

- 1.1 JPL intends to exercise Option 1 as set forth under Article 1, Statement of Work provided the following conditions are met:
  - 1.1.1 Sufficient funds are approved and released by the Government,
  - 1.1.2 The project's continued need exists, and
  - 1.1.3 The delivered Design Concept and Report fully meet the requirements of the Contract.
- 1.2 Option 1 may be exercised no later than completion of Basic Contract by JPL issuance of a Unilateral Modification to the Contract.
- 1.3 The Contractor shall not expend any effort or incur any costs for Option 1 work prior to JPL exercising of the Option. Should JPL not extend/Option this Contract by the current end date, the work products or services delivered through the current end date shall become the final deliverables for this Contract.
- 1.4 If Option 1 is exercised, Article 2, Price and Payment, will be modified as follows:

Under paragraph 1.0, add "Option 1 effort as specified in Article 1, paragraph 2.0 at \$TBD" and delete the Total Fixed Price \$TBD and substitute \$TBD.
- 1.5 Except as modified above, all terms and conditions of this Contract will remain unchanged.

### 2.0 OPTION 2

- 2.1 JPL intends to exercise Option 2 as set forth under Article 1, Statement of Work, provided the following conditions are met:
  - 2.1.1 Sufficient funds are approved and released by the Government,
  - 2.1.2 The project's continued need exists, and
  - 2.1.3 The delivered Bread-Board (BB) antenna fully meets the requirements of the Contract.

The BB design will be down selected to one design for the EM antenna build. The BB designs will be evaluated considering their capability to meet the requirements specified in Exhibit I, their space-flight technology readiness level, their fault-tolerance and robustness, their electrical and mechanical implementation simplicity, and their ability to meet the volumetric and mass constraints. Option 2 will be executed for the best BB design for the EM antenna build.
- 2.2 Option 2 may be exercised no later than completion of Option 1 by JPL issuance of a Unilateral Modification to the Contract.

- 2.3 The Contractor shall not expend any effort or incur any costs for Option 2 work prior to JPL exercising of the Option. Should JPL not extend/Option this Contract by the current end date, the work products or services delivered through the current end date shall become the final deliverables for this Contract.
- 2.4 If Option 2 is exercised, Article 2, Price and Payment, will be modified as follows:  
  
Under paragraph 1.0, add "Option 2 effort as specified in Article 1, paragraph 3.0 at \$TBD" and delete the Total Fixed Price \$TBD and substitute \$TBD.
- 2.5 Except as modified above, all terms and conditions of this Contract will remain unchanged.

ARTICLE 4. SPECIAL PROVISIONS

1.0 Assignment, Novation and Transfer

The subcontract or purchase order may be assigned, novated, or transferred to a successor-in-interest, a successor contractor to operate the Jet Propulsion Laboratory, or the Government.

IN WITNESS WHEREOF, the parties hereto have executed this Subcontract as of the day and year first above written.

CALIFORNIA INSTITUTE OF TECHNOLOGY

CALIFORNIA INSTITUTE OF TECHNOLOGY

By \_\_\_\_\_  
NAME OF ACQUISITION REP  
  
\_\_\_\_\_  
(Title)

**TBD**

By \_\_\_\_\_  
(Signature)  
  
\_\_\_\_\_  
(Typed Name)  
  
\_\_\_\_\_  
(Title)

Instructions to Subcontractor: Do not insert date on Preamble page.